

On this basis, the Market Monitor requests that the Commission give PJM and its stakeholders additional time, in recognition of the substantial progress made, to further develop the required market design details, so that the tariff can reflect a fully developed market design. For all of these reasons, Monitoring Analytics respectfully urges the Commission to reject PJM's March 5, 2012 compliance filing and remand the issue to PJM's stakeholder process for further deliberation and development within a defined time period.

I. BACKGROUND

A. Order No. 775's Requirements.

In Order No. 755, the Commission directed each regional transmission organization ("RTO") and independent system operator ("ISO") to submit a compliance filing to modify their existing tariffs to provide for a two-part payment to frequency regulation resources.⁴

The first part of the two-part payment is a capacity payment for reserving a resource's capacity for the purpose of providing real-time frequency regulation service.⁵ Order No. 755 makes clear that "(t)his payment must be a uniform payment to all cleared resources, and must be a payment that includes the marginal unit's opportunity costs."⁶ Further, Order No. 755 indicates that "(t)his capacity payment also must be based on competitive market-based bids for the provision of frequency regulation capacity submitted by resources."⁷ In its Order No. 755-A, issued February 16, 2012, the Commission restates its

⁴ Order No. 755 at P 106.

⁵ Order No 755 at P 107.

⁶ *Id.*

⁷ *Id.*

requirements for the capacity price, “the uniform clearing price must be market-based, derived from market-participant bids for the provision of frequency regulation capacity.”⁸ In other words, the referenced uniform clearing price for capacity, which would be the basis of a capacity payment determination, would be set on the basis of regulation capacity offers that includes the marginal capacity resource’s opportunity cost.

This latter point, that the payment must include the marginal unit’s actual opportunity cost is important, as it is this feature of the capacity offers, and the resulting capacity market price, that eliminates out of market make whole payments that, in part, cause discriminatory market results. In Order No. 755, the Commission discussed PJM’s current regulation market design as an example of a market that did not apply the opportunity cost payment uniformly to all cleared capacity resources, but rather provided ex post unit-specific opportunity cost payments. The Commission states:

While PJM provides an ex ante estimate of opportunity costs that is included in the uniform clearing price, it also provides ex post ‘make whole payments based on individual unit opportunity costs, something that is not reflected in the uniform market clearing price calculation.⁹

Subsequently, the Commission found that ex ante pricing “methods have the potential to inefficiently select regulating resources and also fail to reflect the marginal cost (including opportunity cost) that determines the market-clearing price paid to all cleared suppliers.”¹⁰

^{8 8} Order No 755-A at P 2.

⁹ Order No. 755, at P 11.

¹⁰ Order No. 755 at P 11.

The second element of the two-part payment is “a performance payment that reflects the amount of work each resource performs in real-time.”¹¹ Order No. 755 requires that “(t)his payment must reflect the accuracy with which each resource responds to the system operator’s dispatch signal.” Order No. 755 requires that the payment made for work must reflect a price that is based on market based resource bids “that reflect the cost of providing the service.”¹² Order No. 755-A further clarifies that the performance payment must be based on “a market-based price, rather than an administratively-determined price, on which to base the frequency regulation payment.”¹³ More specifically, “the price must reflect the market-participant bid submitted by resources for the provision of frequency regulation service.”¹⁴ In other words, the referenced market based price for performance (work) must be set on the basis of resource bids that reflect the incremental cost of providing the service.

B. PJM’s Compliance Filing.

In response to Order No. 755, PJM submitted its March 5, 2012 compliance filing. PJM’s filing has two broad proposals. The first proposal (Regulation Market Design Proposal) is intended to outline a regulation market design that meets the objectives of Order No. 755. The second proposal (Five Minute Optimization Proposal) attempts to link

¹¹ Order No. 755 at P 107.

¹² Order No. 755 at P 107.

¹³ Order No. 755-A P 2.

¹⁴ Order No. 755-A at P 2.

PJM's scarcity pricing proposal from its Order No. 719 compliance filing to the issues in Order No. 755.¹⁵

1. PJM's Regulation Market Design Proposal.

Within its Order No. 755 Regulation Market Design Proposal, PJM has outlined in broad terms a two offer based regulation market that makes use of actual hourly integrated, rather than ex ante estimated, opportunity cost calculations to attempt to eliminate out of market payments caused by the market's current ex-ante market clearing and pricing. Although PJM's market design would still make hourly regulation assignments prior to the operational hour based on ex ante estimated opportunity costs,¹⁶ it would use actual opportunity costs, based on actual five minute market prices, to determine the hourly integrated prices for the assignments.¹⁷

¹⁵ PJM compliance filing in Docket No. ER09-1063-004 (June 18, 2010); *Wholesale Competition in Regions with Organized Markets*, Order No. 719, 125 FERC ¶ 61,071 (2008) ("Order No. 719"), *order on reh'g*, Order No. 719-A, 128 FERC ¶ 61,059 (2009).

¹⁶ "Section 1.11.4(b) of Schedule 1 of the Operating Agreement and its proposed revisions thereto satisfy this directive by requiring that PJM select the regulation resources that clear on the basis of: (1) each resource's regulation offer and the estimated opportunity cost of the resource providing regulation service as calculated by PJM; and (2) in accordance with PJM's obligation to minimize the total cost of energy, operating reserves, regulation, and other ancillary services. PJM estimates each offeror's opportunity costs on the basis of the expected value of the energy sales that would be foregone or uneconomic energy that would be produced by the resource in order to provide regulation. Moreover, the proposed Total Regulation Market-clearing Price established for each hour includes the highest sum (from among the selected units) of a resource's accuracy-adjusted capability offer, accuracy-adjusted performance offer, and estimated opportunity costs." PJM at 13-14.

¹⁷ "Generation resources or Demand Resources offering to sell Regulation shall be selected to provide Regulation on the basis of each generation resource's and Demand Resource's regulation offer and the estimated opportunity cost of a resource providing regulation and in accordance with the Office of the Interconnection's obligation to minimize the total cost of energy, Operating Reserves, Regulation, and other ancillary services. Estimated opportunity costs for generation resources shall be determined by the Office of the Interconnection on the basis of the expected value of the energy

The Market Monitor believes that PJM’s Regulation Market Design Proposal, as currently proposed, represents a significant step in the right direction. However, the the current proposal needs more clarification and refinement before it successfully addresses the design criteria and policy concerns raised in Order No. 755.

2. PJM’s Cooptimization Proposal(s).

PJM claims that its Regulation Market Design Proposal will not, on its own, eliminate the need for make-whole payments. Specifically, PJM argues that to complete elimination of make-whole payments, “PJM must eliminate the uncertainty of estimated system conditions by jointly optimizing and pricing energy, reserves, and regulation on a five-minute basis using actual system conditions.”¹⁸ In other words, PJM is suggesting that it must eliminate the use of estimated opportunity costs for purposes of scheduling and pricing regulation. However, this position on scheduling is inconsistent with the actual PJM Regulation Market Design Proposal, which determines regulation assignments prior to the operating hour on the basis of expected costs, including estimated opportunity costs based on estimated system conditions.¹⁹

The Market Monitor agrees that elimination of out of market payments is an important objective of the regulation market redesign. However, resolution of the out of market payments issue does not require jointly optimizing regulation, reserve and energy

sales that would be foregone or uneconomic energy that would be produced by the resource in order to provide Regulation, in accordance with procedures specified in the PJM Manuals. Estimated opportunity costs for Demand Resources will be zero.” PJM Proposed OA Schedule 1 § 1.11.4.

¹⁸ PJM at 24.

¹⁹ PJM at 13–14.

every five minutes. Resolution of the out of market payments issue requires only that actual five minute prices, rather than forecasted prices, be used to determine the regulation clearing price, cost-based regulation offers and the actual opportunity costs associated with providing regulation capability.

II. PROTEST

The Market Monitor believes that PJM's Regulation Market Design Proposal, as currently proposed, represents a significant step in the right direction. However, the the current proposal needs more clarification and refinement before it successfully addresses the design criteria and policy concerns raised in Order No. 755.

A. The Proposal Lacks Specifics.

PJM's Regulation Market Design Proposal lacks the specifics needed to draw a conclusion that it will satisfy Order No. 755 requirements. PJM's proposal lacks specificity in several key areas regarding actual implementation: the specific nature of performance offers; the interaction between performance offers and the performance clearing price used to clear and settle the market; and the exact nature of the benefits factor used in optimization and settlement. The lack of specificity leaves much of the proposed market design unnecessarily vague, where it should be clear and concise for Commission consideration. In some instances the lack of specificity is in areas that are, or were at the time of PJM's filing, still in development. In many instances in the submitted proposed tariff language, PJM defers specifics of its proposal to the manuals. The Market Monitor respectfully requests that the Commission reject PJM's proposal as submitted and require PJM to complete the stakeholder process to fill in the missing, but essential, details of its proposal. It is not appropriate to propose that key features of the market design be established in manuals, which do not require FERC approval.

1. The Exact Nature of the Benefits Factor Used in Optimization and Settlement Needs to be Made Explicit.

It is only possible to clear a single market with two products, fast response and slow response, if the rate of substitution between them is defined. This rate of substitution is called the benefits factor in PJM's filing. PJM does not specify the rate of substitution between fast and slow resources or how it will be calculated and thus does not define the benefits factor in its proposal. The correct definition of the benefits factor for purposes of market optimization and settlement has been the subject of considerable discussion among PJM, the Market Monitor and stakeholders but the issue was not resolved in the stakeholder process and the issue is not resolved in PJM's filing.

PJM's filing would appear to base market optimization and settlement on unit specific assignment of a benefit factor rather than the marginal or incremental benefit factor.²⁰ PJM's proposal would assign a unit specific benefit factor based on a unit's relative position in the resource stack. Under this approach, fast resources that are taken first (lower price offers) from the supply stack would be treated as displacing more slow resources than fast resources that are taken later (higher price) in the stack.

The KEMA study showed decreasing rates of substitution between fast and slow resources as the proportion of fast resources increases. This means that the rate of substitution decreases as the amount of fast resources used increases. This means that the benefit of every fast resource being used, not just the last one, is declining as more fast

²⁰ PJM page 9. "PJM's proposed performance based two part methodology will appropriately compensate each regulation resource for the benefit it provides to system control and meet the goals set forth by the Commission in its Order No. 755. This will incent the highest value resources to participate in PJM's regulation market which will in turn lead to a lower overall regulation requirement to achieve reliable system control."

resources are added to the regulation commitment. The correct way to include this result in the optimization is to reflect the marginal rate of substitution when determining the relative substitutability of fast and slow resources and therefore the correct market equilibrium. The correct approach results in a uniform price that reflects the marginal value of the resources being used.

Use of the unit specific unit benefit factor would result in the equivalent of a pay as bid outcome rather than a single clearing price outcome. The failure, in PJM's proposal, to reflect the marginal rate of substitution would result in suboptimal ratios of fast to slow resources in the market solutions. The use of unit specific benefit factors for settlement purposes would result in non-uniform, discriminatory compensation among fast resources that cleared in the same market. This would result in a violation of Order No. 755's requirement that prices be uniform and market based, not administrative and discriminatory.²¹

While the nature of the benefits factor was discussed in the stakeholder process, the PJM filing is not explicit about the mechanics of the market solution and therefore about the impact of the benefits factor. The exact nature of the benefits factor needs to be made explicit. The benefits factor should be the, marginal rate of substitution to ensure an efficient market clearing process and non-discriminatory outcomes.

2. The Determination of Performance Offers and the Performance Clearing Price Needs Clarification.

Regulation resources will make two part offers and include a capability offer and a performance offer. The capability offer or capacity offer is an offer price associated with the

²¹ Order No. 755 at PP 11, 107 & 107.

amount of regulation capacity. The performance offer is an offer price associated with the amount of work or mileage that will be provided by each unit of capacity.

The PJM proposal is not clear about the exact definition and determinants of the performance price and performance compensation. The proposed determination of performance offers and the performance clearing price is unclear and appears inconsistent with Order No. 755 requirements that prices reflect the incremental costs of providing work. Specifically, the proposal confuses the incremental cost of performance with the total payments for performance per unit of capability.

Order No. 755 requires that the performance payment for work reflect prices based on market based resource bids “that reflect the cost of providing the service.”²² Order No. 755-A further clarifies that the performance payment must be based on “a market-based price, rather than an administratively-determined price, on which to base the frequency regulation payment.”²³ The Order No. 755 requirements with regard to the Performance Clearing Price imply that the offer price and therefore clearing price of performance should reflect the incremental cost of following the regulation signal (actual mileage), which is then used to compensate resources for work actually done.

The PJM proposal is not adequately clear about the determinants of cost based performance offers. The determinants of performance offers should be the incremental cost of following the regulation signal. The PJM tariff should clearly delineate the types of costs that would be appropriate to include in a resource’s performance offer.

²² Order No. 755 at P 107.

²³ Order No. 755-A at P 2.

While the proposed tariff indicates that participants in the regulation market must submit cost based capability and performance offers, the Proposed Tariff language does not specify the determinants of the cost of performance in dollars per change in MW. While the tariff delineates items that can be included in cost offers, it does not, with the exception of the \$12 adder, indicate which elements are applicable to performance offers and which elements are not. PJM's proposed tariff revision states:

A cost-based offer must be in the form specified in the PJM Manuals and consist of the following components as well as any other components specified in the PJM Manuals:

- i. The costs (in \$/MW) of the fuel cost increase due to the heat rate increase resulting from operating a unit at lower megawatt output incurred from the provision of Regulation;
- ii. The cost increase (in \$/MW) in variable operating and maintenance costs resulting from operating the unit at lower megawatt output incurred from the provision of Regulation; and
- iii. An adder of up to \$12.00 per megawatt of Regulation provided applied to the capability offer.²⁴

The total cost per MW of effective capability appears appropriate for determining relative costs for ex ante commitment purposes, but it is not clear, based on the proposal, that this calculation is appropriate for determining the market clearing price for performance based on the incremental cost of work. For example, take two resources, A and B each with 1 MW of effective capability. Resource A is expected to provide 10 MW of work for every MW of effective capability. Resource B is expected to provide 1 MW of work for every MW of effective capability. Both resources have zero costs for capability (no lost opportunity cost (LOC)) and both resources have an incremental cost of work (dollars per

²⁴ PJM proposed OA Schedule 1 § 1.10.1A(e).

mile of movement) of \$1. Based on a total cost approach, Resource A has a performance offer of \$10 and Resource B has a performance offer of \$1. Assuming Resource A sets the Performance Clearing Price per unit of capability, using PJM's proposed payment for performance calculation ("equal to the Performance Clearing Price times the cleared capability megawatts"²⁵), the total payment to Resource A would be \$10 and total payment to Resource B would be \$10 (both resources have 1 MW of effective capability).²⁶

Based on an incremental cost of work approach, the price per unit of work is \$1 and payment for performance would be based on work done times \$1 per mile of movement. Under this more appropriate incremental cost approach, Resource A would be paid \$10 and Resource B would be paid \$1.

The PJM proposal needs to detail and explain the interactions between the incremental cost of work and the Performance Clearing Price in the context of its proposal.

3. The Relationship Between Estimated and Actual Performance Must Be Explicitly Defined.

PJM's proposal is not clear about the relationship among performance offers, the Performance Clearing Price and the payment for performance. PJM's proposal indicates that the payment for performance is set "equal to the Performance Clearing Price times the cleared capability megawatts ("Performance Payment")."²⁷ PJM's calculation, as presented, assumes a fixed relationship before the actual hour between a MW of cleared capability and the actual amount of work done for fast and slow resources, but the nature of this direct

²⁵ PJM at 11.

²⁶ This assumes benefit factors of 1, etc.

²⁷ PJM at 11.

relationship is not explained in the filing. The amount of work actually done in any given hour (the actual total mileage of the regulation signal and the unit's effectiveness in following the signal) will vary according to system conditions and unit performance. Using a fixed ratio between capacity and mileage based on historical performance would result in over and under collection in any given hour.

PJM's proposal has not specified how clearing prices will reflect the actual requested mileage based on the regulation signal and the actual performance of units in following that signal.

4. PJM's Proposed Regulation Market Design Would Result in Prices That Do Not Reflect the Incremental Cost of Regulation and Will Not Eliminate the Need for Make Whole Payments.

Order No. 755 requires that regulation markets result in uniform, market based prices that reflect the actual, not forecasted, incremental cost of providing regulation services. For regulation capacity, "the uniform clearing price must be market-based, derived from market-participant bids for the provision of frequency regulation capacity."²⁸ Further, Order No. 755 makes clear that "(t)his payment must be a uniform payment to all cleared resources, and must be a payment that includes the marginal unit's opportunity costs."²⁹ This latter point, that the payment must include the marginal unit's actual opportunity cost is important, as is this feature of the capacity offers, and the resulting capacity market price, that eliminates out of market make whole payments that, in part, cause discriminatory market results.

²⁸ Order No 755-A at P 2.

²⁹ *Id.*

As presented, PJM's proposed methodology for calculating and setting the Total Regulation Market-clearing Price, the Performance Clearing Price and the Capability Clearing Price is not consistent with the Commission's Regulation market design criteria. PJM's proposal of calculating the Capability Clearing Price as a residual generated by subtracting the highest adjusted performance cleared offer is not consistent with Order No. 755's directive that regulation prices must be uniform, market based and reflect the incremental cost of providing regulation services, including actual, not estimated, opportunity costs. As a result, PJM's proposed regulation market design will not eliminate the need for make whole payments, even with the use of actual ex post opportunity costs in the capacity based offers.

PJM's proposal does not provide a market based capability result, on the basis of incremental cost to provide each service, nor is the total price reflective of the marginal cost to provide regulation.³⁰ PJM's proposal provides a "total incremental cost" price, in the form of Total Regulation Market-clearing Price, that is apportioned administratively between capability and performance. In determining the Capability Clearing Price, PJM proposes to calculate the regulation capability clearing price by subtracting the Performance Clearing Price from the Total Regulation Clearing Price, where the Regulation Performance Clearing Price is based on the highest adjusted performance offer of the resources that cleared in step one in the unit commitment.³¹ While the capability offers of

³⁰ Whether the Total Regulation Market-clearing Price reflects the total incremental cost of regulation service in a given hour will depend on (i) the nature of the benefit factor used in the final market design and (ii) the final nature of the unit specific performance offers used in the market.

³¹ PJM at 13.

resources are reflected in the Total Regulation Clearing Price, this methodology of determining the Capability Clearing Price as a residual will not reflect the actual incremental cost of providing capability, including actual opportunity cost.

In some cases, depending on how the performance price is set and whether performance is actually compensated on the basis of expected or actual required work done in the hour, determination of a residual Capability Clearing Price could result in under collection of capability reservation costs. Unfortunately, as noted above, the PJM proposal is not clear on these details.

For example, if there is a market with two regulation providers, each with 1 MW of regulation capability. Provider A has an incremental capability reservation price of \$9 and an incremental cost of performance of \$1, with 1 MW of performance expected (slow resource signal). The total incremental cost of Provider A is \$10. Provider B has an incremental capability reservation price of \$0 and an incremental cost of performance of \$9, with 1 MW of performance expected (fast resource signal). The total incremental cost per MW of capability for Provider B is \$9. The Total Regulation Clearing Price would be \$10, set by A. The Performance Clearing Price would be \$9 set by B. The Capability Clearing Price would be \$1 (Total Regulation Clearing Price - Performance Clearing Price). This case is consistent because expected performance equals actual performance.

However, if only 0.5 MW of performance is required of Provider A, and 1 MW is required of Provider B, then the case is not consistent. If payments are based on actual not expected work, Provider A would receive \$1 for its capability and \$4.50 for its required performance and will not cover its costs. Provider B would earn \$10, which is sufficient to cover its costs.

The issue is that the market outcome if actual performance requirements in the hour are insufficient to generate revenues sufficient to cover the capability costs of units when these costs are greater than the administratively determined residual Capability Clearing Price.³²

B. PJM’s Cooptimization Proposal Does Not Eliminate Out of Market Payments, Is Not the Only Alternative Available and Is Outside of the Scope of Compliance In This Proceeding.

PJM claims that its Regulation Market Design Proposal will not, on its own, eliminate the need for make-whole payments. Specifically, PJM argues that to complete elimination of make-whole payments, “PJM must eliminate the uncertainty of estimated system conditions by jointly optimizing and pricing energy, reserves, and regulation on a five-minute basis using actual system conditions.”³³ In other words, PJM is suggesting that it must eliminate the use of estimated opportunity costs for purposes of scheduling and pricing regulation in order to eliminate out of market payments. More specifically, PJM suggests that PJM’s Market-based Pricing Option, pending Order No. 719 Compliance Filing, is the only real option five minute optimization model to consider. The Market Monitor disagrees with both assessments.

³² Under the proposed two offer methodology, PJM will: (1) include a resource’s lost opportunity costs, accuracy-adjusted capability offer and accuracy-adjusted performance offer to determine the incremental total cost for each resource in the ranking and clearing process with the highest ranked resource that clears setting a total regulation market-clearing price (“Total Regulation Market-clearing Price”); (2) calculate a regulation performance clearing price based on the highest adjusted performance offer of the resources that cleared in step one (the “Performance Clearing Price”); and (3) calculate a regulation capability clearing price by subtracting the Performance Clearing Price from the Total Regulation Clearing Price (the “Capability Clearing Price”).³²

³³ PJM at 24.

1. Eliminating Out of Market Payments Requires the Use of Actual, Not Estimated Five Minute Prices.

The Market Monitor agrees that elimination of out of market payments is an important objective of the regulation market redesign. However, resolution of the out of market payments issue does not require jointly optimizing regulation, reserve and energy every five minutes. Resolution of the out of market payments issue requires only that actual five minute prices, rather than forecasted prices, be used to determine the regulation clearing price, cost-based regulation offers and the actual opportunity costs associated with providing regulation capability.

PJM recognizes this when it outlines its proposed basis of the Capability Clearing Price:

Paying to *each* cleared resource the Capability Clearing Price, which includes the marginal resource's lost opportunity costs described in step one, satisfies the Commission's directive to pay all cleared frequency regulation resources a uniform clearing price that includes the marginal resource's opportunity costs.³⁴

2. The issue of Five Minute Cooptimization of Resources Is Not Relevant to This Proceeding.

The use of five minute cooptimization is not required for the functioning of the PJM regulation market as proposed. The use of five minute cooptimization is not required for the elimination of make whole payments in the regulation market. PJM's own proposal indicates that regulation commitments will be made prior to the operational hour, based on forecasted opportunity costs and forecasted conditions, not as part of a five minute joint

³⁴ PJM at 11 (emphasis in original).

optimization of reserves, regulation and energy.³⁵ PJM also notes that “(c)ommitment of resources sufficiently ahead of the timeframe for which they provide regulation service ensures that resource owners have sufficient time to position their resource to regulate in the upcoming hour.”³⁶ This means that under PJM’s optimization proposals, regulation assignments would will be held constant, and would be used as a constraint on the five minute optimization of reserves and energy. All that is needed to resolve the issues raised are the use of actual opportunity costs, rather than forecasted opportunity costs in the determination of regulation clearing price.

3. The Market Monitor’s Alternative Proposal for Compliance with Order No. 719’s Scarcity Pricing Directive Is Equally Compatible with Five Minute Cooptimization.

The use or absence of five minute cooptimization is beyond the scope of this proceeding. The Commission does not accept on compliance proposals beyond the scope of what is necessary to comply with its directives.³⁷ However, to the extent that Commission

³⁵ “Section 1.11.4(b) of Schedule 1 of the Operating Agreement and its proposed revisions thereto satisfy this directive by requiring that PJM select the regulation resources that clear on the basis of: (1) each resource’s regulation offer and the estimated opportunity cost of the resource providing regulation service as calculated by PJM; and (2) in accordance with PJM’s obligation to minimize the total cost of energy, operating reserves, regulation, and other ancillary services. PJM estimates each offeror’s opportunity costs on the basis of the expected value of the energy sales that would be foregone or uneconomic energy that would be produced by the resource in order to provide regulation. Moreover, the proposed Total Regulation Market-clearing Price established for each hour includes the highest sum (from among the selected units) of a resource’s accuracy-adjusted capability offer, accuracy-adjusted performance offer, and estimated opportunity costs.” PJM at 13–14.

³⁶ PJM at 23

³⁷ See, e.g., *PJM Interconnection, L.L.C.*, 137 FERC ¶ 61,216 (2012).

may be considering resolving outstanding issues of Order No. 719 in this proceeding, it is important to address PJM five minute optimization proposals.

PJM offers two possibilities for possible joint optimization models, the “Market-based Pricing Option” and the “Administrative Cap Option.” The Market Monitor agrees that PJM’s proposed Administrative Cap Option, which holds reserve and regulation LOC prices constant during scarcity, would not eliminate out of market payments and will create system control issues, as the incentive to provide reserves will be greater than the incentive to provide energy. However, the Market Monitor disagrees that the “shortage approach,” termed the “Market-based Pricing Option,” suggested by PJM is the only other option. There is a third alternative, which was proposed by the Market Monitor during the Order No. 719 proceedings (Constraint Relaxation Option).³⁸

As presented in the Order No. 719 proceedings, the Market Monitor’s Constraint Relaxation Option provides a fully functional alternative to PJM’s “Market-based Pricing Option.” The Constraint Relaxation Option is a five minute optimization model that jointly optimizes reserves and energy, using reserve related penalty factors and constraint relaxation. As proposed, the Constraint Relaxation Option has a number of advantages over PJM’s “Market-based Pricing Approach.” First, the Constraint Relaxation Option allows maximum realized energy prices to be consistent with resource offer caps. This eliminates the dichotomy that the PJM approach creates between the day-ahead and real-time market results and offer stacks. Relative to the opportunity costs that affect the reserve and

³⁸ See Protest and Compliance Proposal of the Independent Market Monitor for PJM filed in ER09-1063-004 (July 19, 2010); Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM in ER09-1063-004 (August 6, 2010); Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM in ER09-1063-004 (September 7, 2010).

regulation markets, the difference between the PJM and the Market Monitor’s approach is that the “Market-based Pricing Option” administratively holds the opportunity cost component of reserve prices constant and drives LMPs to support that constant opportunity cost level, while the Constraint Relaxation Option sets the energy price at the offer cap level, and allows the opportunity cost component to continue to be derived relative to energy prices. Both approaches allow for full automated system control, as resources are indifferent between providing energy, reserves and regulation on the margin.

III. CONCLUSION

The Market Monitor respectfully requests that the Commission afford due consideration to these comments as it resolves the issues raised in this proceeding.

Respectfully submitted,



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CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Eagleville, Pennsylvania,
this 26th day of March, 2012.



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